Appendix

Elasticity-based Assessments

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A. Methodology for Elasticity-based Assessments

Revenue-based

The elasticity weighted contribution factor, cf_i, is defined for each industry segment i as

$$cf_i = (k \bullet CF) / \varepsilon_i$$

where

CF = overall contribution factor,

ε_i = elasticity of demand for industry segment i.

The scale factor k is determined by

$$k = CB/ (\Sigma cb_i / \varepsilon_i)$$

where

CB = total contribution base, and

cb_i = contribution base of industry segment i .

Connections-based (1)

The elasticity weighted connection charge, c_i, is defined for each industry segment i as

$$cf_i = (k \bullet CF) / \varepsilon_i$$

and the elasticity weighted capacity charge, cc_i, is defined for each industry segment i as

$$cc_i = (k \bullet CC) / \varepsilon_i$$

where

CF = flat-rate connection charge,

CC = capacity charge, and

ε_i = elasticity of demand for industry segment i.

The scale factor k is determined by

$$k = (CF \bullet CBF + CC \bullet CBC) / (CF \bullet \sum cbf_i / \varepsilon_i + CC \bullet \sum cbc_i / \varepsilon_i)$$

where

CBF = total flat-rate connection base,

CBC = total capacity-rated connection base,

cbf_i = flat-rated connection base of industry segment i , and

cbc_i = capacity-rated connection base of industry segment i .

Connections-based (2)

The elasticity weighted connection charge, c_i, is defined for each industry segment i as

$$c_i = (k \bullet C) / \varepsilon_i$$

where

C = overall connection charge,

ε_i = elasticity of demand for industry segment i.

The scale factor k is determined by

$$k = CB / (\sum cb_i / \varepsilon_i)$$

where

CB = total connection base, and

cb_i = connection base of industry segment i .

Numbers-based

The elasticity weighted number charge, n_i, is defined for each industry segment i as

$$n_i = (k \bullet N) / \varepsilon_i$$

where

N = overall number charge,

ε_i = elasticity of demand for industry segment i.

The scale factor k is determined by

$$k = CB/ (\Sigma cb_i / \varepsilon_i)$$

where

CB = total number base, and

cb_i = number base of industry segment i .

B. Assumptions regarding elasticity of demand

The following values are used for ε, the elasticity of demand for telecommunications services in the three industry segments: IXC, LEC and CMRS [1].

- Elasticity of demand for wireless services is about –0.7
- Elasticity of demand for IXC services is about –0.7
- Elasticity of demand for LEC services is about –0.1

[1] See Nextel December 2002 *Ex Parte* at Attachment (Impact of Universal Reform on the Wireless Industry) page 8 and at Attachment (Economic Welfare Cost of Taxes, Fees and Assessments) pages 14-15.

C. Elasticity weighted Revenue-based approach

The revenue contribution base is from the FCC Staff Study:

Contribution Base – Revenue-based Approach				
	2004	2005	2006	2007
Contribution Factor	0.096	0.100	0.106	0.114
Contribution Base ($M)				
IXC	$38,527	$36,348	$34,246	$31,527
LEC	$22,509	$23,470	$24,026	$24,622
CMRS	$19,163	$20,242	$20,643	$20,607
Total ($M)	$80,199	$80,060	$$78,915	$76,756

The elasticity-weighted contribution factors can be calculated as:

Elasticity-weighted Contribution Factors				
	2004	2005	2006	2007
IXC	0.036	0.036	0.037	0.039
LEC	0.250	0.254	0.262	0.273
CMRS	0.036	0.036	0.037	0.039

The burden, using elastic contribution factors can be calculated as follows:

Relative Burden with Elasticity-weighted Contribution Factors				
	2004	2005	2006	2007
IXC	18%	16%	15%	14%
LEC	73%	74%	76%	77%
CMRS	9%	9%	9%	9%

Compared to the burden calculated for the revenue-based approach, there is a shift from the more elastic services (e.g. CMRS and IXC) to the more inelastic services of the LECs.

Relative Burden Revenue-based Approach				
	2004	2005	2006	2007
IXC	48%	45%	43%	41%
LEC	28%	29%	30%	32%
CMRS	24%	25%	26%	27%

D. Elasticity weighted Connection-based approach (1)

The connection (and capacity) contribution base is from the FCC Staff Study:

Contribution Base – Connection-based Approach (1)				
	2004	2005	2006	2007
Flat-rate connection fee	$1.0000	$1.0265	$1.0349	$1.0510
Capacity-based fee	$2.6189	$2.5548	$2.6070	$2.6964
Contribution Base (M)				
IXC connections	0	0	0	0
IXC capacity units	47.4	48.7	50.1	51.6
LEC connections	126.5	125.5	123.1	120.3
LEC capacity units	62.7	63.7	64.4	64.0
CMRS connections	160.4	173.0	183.5	191.2
CMRS capacity units	0	0	0	0
Total flat-rate connections	286.9	298.5	306.6	311.5
Total capacity units	110.2	112.4	114.5	115.6

The elasticity-weighted connection charges can be calculated as:

Elasticity-weighted Connection Charges				
	2004	2005	2006	2007
IXC flat-rate	$0.248	$0.260	$0.267	$0.276
IXC capacity charge	$0.650	$0.648	$0.673	$0.709
LEC flat-rate	$1.738	$1.822	$1.871	$1.935
LEC capacity charge	$4.551	$4.536	$4.712	$4.963
CMRS flat-rate	$0.245	$0.257	$0.263	$0.272
CMRS capacity charge	$0.641	$0.639	$0.664	$0.699

The burden, using elastic contribution factors can be calculated as follows:

Relative Burden with Elasticity-weighted Connection Charges				
	2004	2005	2006	2007
IXC	5%	5%	6%	6%
LEC	88%	87%	87%	86%
CMRS	7%	8%	8%	8%

Again, when compared to the burden calculated for the connection-based approach (1) in the staff study, there is a shift from the more elastic services to the inelastic services of the LECs.

Relative Burden Connection-based Approach (1)				
	2004	2005	2006	2007
IXC	23%	22%	22%	22%
LEC	49%	47%	46%	45%
CMRS	28%	30%	31%	31%

E. Elasticity weighted Connection-based approach (2)

The connection contribution base is from the FCC Staff Study:

Contribution Base – Connection-based Approach (2)				
	2004	2005	2006	2007
Access fee	$0.7073	$0.7040	$0.7134	$0.7241
Transport fee	$0.7073	$0.7040	$0.7134	$0.7241
Contribution Base (M)				
IXC	259.0	255.0	244.5	241.6
LEC	175.2	175.3	171.1	166.6
CMRS	312.3	334.7	350.4	358.2
Total units - access	439.0	472.8	493.5	516.6
Total units – transport	322.8	324.0	321.4	316.4
Total units	761.8	796.8	814.9	833.0

The elasticity-weighted contribution factors can be calculated as:

Elasticity-weighted Connection Charges				
	2004	2005	2006	2007
IXC access fee	$0.300	$0.309	$0.324	$0.342
IXC transport fee	$0.300	$0.309	$0.324	$0.342
LEC access fee	$2.098	$2.161	$2.270	$2.391
LEC transport fee	$2.098	$2.161	$2.270	$2.391
CMRS access fee	$0.300	$0.309	$0.324	$0.342
CMRS transport fee	$0.300	$0.309	$0.324	$0.342

The burden, using elastic contribution factors can be calculated as follows:

Relative Burden with Elasticity-weighted Connection Charges				
	2004	2005	2006	2007
IXC	14%	14%	14%	14%
LEC	68%	68%	67%	66%
CMRS	17%	18%	20%	20%

Compared to the burden calculated for the connection-based approach (2) in the staff study, there is a shift from the more elastic services to inelastic services.

Relative Burden Connection-based Approach (2)				
	2004	2005	2006	2007
IXC	34%	32%	30%	29%
LEC	23%	22%	21%	20%
CMRS	41%	42%	43%	43%

F. Elasticity weighted Number-based approach

The number contribution base is from the FCC Staff Study:

Contribution Base – Number-based Approach				
	2004	2005	2006	2007
Fee-switched services	$0.9910	$0.9959	$1.0070	$1.0237
Fee-sp. access/pr. lines	$0.9910	$0.9959	$1.0070	$1.0237
Contribution Base (M)				
IXC	77.6	80.1	82.2	77.9
LEC	321.4	326.2	328.8	329.7
CMRS	155.1	171.7	182.0	185.8
Total numbers	554.1	572.2	587.2	599.5

The elasticity-weighted contribution factors can be calculated as:

Elasticity-weighted Number Charges				
	2004	2005	2006	2007
IXC	$0.221	$0.225	$0.230	$0.239
LEC	$1.548	$1.574	$1.613	$1.670
CMRS	$0.221	$0.225	$0.230	$0.239

The burden, using elastic contribution factors can be calculated as follows:

Relative Burden with Elasticity-weighted Number Charges				
	2004	2005	2006	2007
IXC	3%	3%	3%	3%
LEC	91%	90%	90%	90%
CMRS	6%	7%	7%	7%

Compared to the burden calculated for the numbers-based approach in the staff study, there is a shift from the more elastic services such as CMRS and IXC to the more inelastic services of the LECs.

Relative Burden Number-based Approach				
	2004	2005	2006	2007
IXC	14%	14%	14%	13%
LEC	58%	57%	56%	55%
CMRS	28%	30%	31%	31%